DOCKER

Page No.:____
Date: 28/03/22

* Containerization

It is a form of virtualization where application run in isolated user environment (spaces), called containers, while using the same shared operating system.
It is a fully packaged and portable computing environment

A docker is the containerization tool/platform which is used to package the application and all it's binaries, configuration files, and dependencies together in the form of containers.

* Virtualization

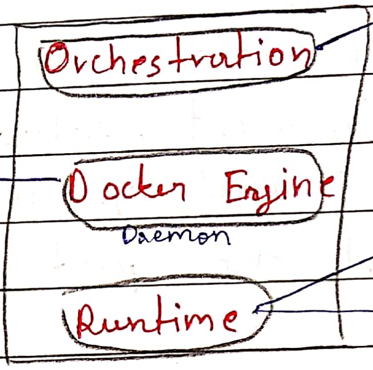
It refers to the creation of a virtual version of a resource or device such as desktop, OS, file storage or network.
It enables companies to reduce hardware costs and increase efficience.
Tools -> VMware, VirtualBox

* Hypervisor

It is a software that creates and runs multiple virtual machines and manage it, it is also known as virtual machine monitor (VMM), It helps to divide the resou to new VM. Manage the resources

* Container - Running instance of an image

* Docker Architecture



Docker Swarm, Kubernetes
Allows to manage containerized applications.

~~Allows to~~ manage ~~container and~~ it interact with API

① RunC - allows ~~OS~~, start and Stop containers, manage OS

② Container D - manage RunC and all the internet things, connectivity, network

Volumes - folder on your host machine, mapped into container, can can r/write data to volume

* Docker daemon

It listens to the API request made through the docker client and manages ~~the~~ Docker objects such as images, container, volumes (Imp) and networks.

The docker client can communicate with more than one daemon.

* Docker file → normal text file [Dockerfile] (casesensitive)

Describe steps to create a docker image

```
→ from ubuntu                         } from
      Env   userna=admin              } Environment variable
            Mood DB=pass              }
      Run mkdir - home/app
      COPY . /home/app                } directory
      CMD ["echo", "Hello Wor"]
      CMD ["node", "home/app/ server.js"]
```

* Container is a runnable instance of an image*

* Docker Image

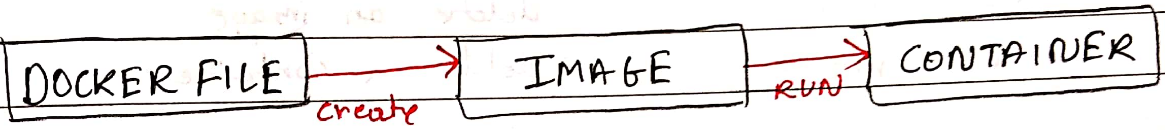
A docker image is a file which ~~which~~ that defines a docker container.

It is similar in concept of snapshot

Docker image is run to create a docker contains

IMAGES ARE IMMUTABLE

* Docker can build images automatically by reading instruction from dockerfile. A single image can be used to create multiple container.



* DOCKER COMMANDS

name of imag — version or anything

1. docker build -t myapp:1.0 . — current directory

Used to build image from specified docker file

2. docker pull <image name>   docker pull ubuntu

It will install image ubuntu on local repo from→docker hub

--env

3. docker run -it -d <image name>

Create a container from image

4. docker images

List all the local images

-all

5. docker ps -a — shows exited containers too

list all the running container

Date: __/__/__

use to rename img/clone

docker tag oldname:tag newname
optional

6. docker exec -it <containerid> /bin/sh /bin/bash
Use to access the running container , exit

7. docker stop <container-id>
kill
Stops a running container

-m "message" cid img name

8. docker commit <container id> <username/image name>
Creates a new images of an edited container

docker image prune -a delete all img

9. docker rmi image id delete an image

docker rm container id delete a container

docker container prune -a

* Dockerfile — Base img of project

- FROM python:3.9
- WORKDIR /any-name → creates folder in cont
- COPY . /any-name — copies current dir files to any-name
- RUN pip install -r requirement.txt — install all dependencies
  [pip freeze > requirement.txt] — creates list of dependies of project
- EXPOSE 8000 → any portno
- CMD ["python", "manage.py", "runserver"] → cmd to execute in cont

cmd

→ • docker build .

• docker images

• docker run -p 8000:8000 img-id

* Multi stage build Dockerfile

Has 2-3 or more dockerfile in it → merged

eg. docker-compose.yaml

• docker info | grep -i root
Gives root directory of docker

* Volomes - Annonymous, Named, Bind mounts

Creates network * docker network create networ-name → use to talk with others conteiner

YAML file * docke- compose build up / down -v → use to bulid img -run cont at sone time